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EXAMINER	
WILLIAMS, LAWRENCE B	

ART UNIT	PAPER NUMBER
2638	

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/823,299	MAGOON ET AL.	
	Examiner	Art Unit	
	Lawrence B Williams	2634	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *03 October 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *29-55* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *29-55* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 29, 31-34, 41, 43-45 are rejected under 35 U.S.C. 102(b) as being anticipated by Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator).

(1) With regard to claim 29, Boveda et al. discloses in Fig(s). 3-4, a polyphase filter, comprising: a first phase splitting filter comprising a first RC network, the first phase splitting filter configured to provide a first output; a second phase splitting filter comprising a second RC network, the second phase splitting filter configured to provide a second output; a first variable resistance separate from the first RC network, the first variable resistance connected across the first output; and circuitry capable of detecting the phase of the outputs produced by the first and second outputs (pg. 1341, III Circuit Design)., and circuitry capable of adjusting the first variable resistance to produce a desired phase difference between the first output and the second output (pg. 1344, Adjustable Phase Shifter). Boveda et al. discloses the adjustable phase shifter with variable resistors and a trimmer for phase adjustment. Phase detecting would be inherent.

(2) With regard to claim 31, Boveda et al. also discloses in Fig. 3, wherein the first and the second outputs are differential outputs (pg. 1346, Differential and Output Stages).

(3) With regard to claim 32, Boveda et al. also discloses in Fig. 4, the filter of claim 29, comprising a second variable resistance separate from the second RC network and connected across the second output (pg. 1344, Adjustable Phase Shifter).

(4) With regard to claim 33, Boveda et al. also discloses wherein the first variable resistance and the second variable resistance include transistors (pg. 1344, Adjustable Phase Shifter).

(5) With regard to claim 34, Boveda et al. also discloses wherein the transistors include at least one MOSFET transistor operated in the linear range (pg. 1344, Adjustable Phase Shifter).

(6) With regard to claim 41, claim 41 discloses limitations similar to those disclosed in claim 1, above. Therefore a similar rejection applies.

(7) With regard to claim 43, claim 43 inherits all limitations of claim 41. Furthermore, Boveda et al. also discloses in Fig. 3, wherein the first and the second outputs are differential outputs (pg. 1346, Differential and Output Stages).

(8) With regard to claim 44, claim 44 inherits all limitations of claim 41. Furthermore, Boveda et al. also discloses wherein the first variable resistance and the second variable resistance include transistors (pg. 1344, Adjustable Phase Shifter).

(9) With regard to claim 45, claim 45 inherits all limitations of claim 44 above. Furthermore, Boveda et al. also discloses wherein the transistors include at least one MOSFET transistor operated in the linear range (pg. 1344, Adjustable Phase Shifter).

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> ((e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 55 is rejected under 35 U.S.C. 102(e) as being anticipated by Nash (US 6,317,589 B1).

Nash discloses in Fig. 3, a method for obtaining accurate quadrature separation of phase components on a radio frequency carrier that can be mapped on an I-Q plane, comprising: generating a fixed local oscillator frequency (112); splitting the local oscillator frequency into two signals having a predetermined phase difference to produce a first output and a second output (314), mixing the first output (110) and the second output (308) with a radio frequency test signal to generate an I baseband signal and a Q baseband signal; detecting the phase difference between the 1 baseband signal and the Q baseband signal (320); and adjusting (the phase difference of the first output and/or the second output to produce a desired phase difference between the I baseband signal and the Q baseband signal (col. 4, lines 20-33).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. Claims 30, 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claims 1, 41 above, and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 30, claim 30 inherits all limitations of claim 29, above. As noted above, Boveda et al. discloses all limitations of claim 29 above. Boveda et al. does not however disclose wherein the first output and second output are single-ended outputs.

However, Havens et al. discloses a phase splitter wherein first output and second output are single-ended outputs (col. 5, lines 29-31).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Haven et al. with the invention of Boveda et al. as a method of insuring a set phase difference value (col. 1, lines 19-28).

(2) With regard to claim 42, claim 42 discloses limitations similar to those disclosed in claim 30 above. Therefore a similar rejection applies.

7. Claims 35, 46 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claims 32, 41, respectively above, and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 35, claim 35 inherits all limitations of claim 32, above. As noted above, Boveda et al. discloses all limitations of claim 32 above. Boveda et al. does not however disclose wherein the first variable resistance and the second variable resistance include a bipolar differential pair.

However, Havens et al. discloses wherein the first variable resistance and the second variable resistance includes a bipolar differential pair (col. 6, lines 42-51).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Haven et al. with the invention of Boveda et al. as a method of insuring a set phase difference value (col. 1, lines 19-28).

(2) With regard to claim 46, claim 46 discloses limitations similar to those disclosed in claim 35. Therefore a similar rejection applies.

8. Claims 36, 47 are rejected under 35 U.S.C. 102(b) as anticipated by or, in the alternative, under 35 U.S.C. 103(a) as obvious over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claims 32, 41, respectively above.

(1) With regard to claim 36, though Boveda et al. does not teach wherein the first variable resistance and the second variable resistance include a digitally switchable resistance pair, this limitation would be merely a design choice to one skilled in the art to incorporate the many advantages of digital technology.

(2) With regard to claim 47, claim 47 discloses limitations similar to those disclosed in claim 36. Therefore a similar rejection applies.

9. Claims 37, 38, 48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claims 29, 41, respectively above, and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 37, claim 37 inherits all limitations of claim 29, above. As noted

above, Boveda et al. discloses all limitations of claim 29 above. Boveda et al. does not however disclose wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator and a differential amplifier.

However, Havens et al. discloses a phase splitter wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator and a differential amplifier (col. 6, lines 1-13; col. 7, lines 28-37).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Haven et al. with the invention of Boveda et al. as a method of insuring a set phase difference value (col. 1, lines 19-28).

(2) With regard to claim 38, Haven et al. also discloses wherein the circuitry capable of detecting the phase of the outputs includes a phase detector, an integrator, a differential amplifier, a capacitor and a controller for selectively storing and holding the output of the differential amplifier in the capacitor (col. 5, line 36 – col. 5, line 27).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Haven et al. with the invention of Boveda et al. as a method of insuring a set phase difference value (col. 1, lines 19-28).

(3) With regard to claim 48, claim 48 discloses limitations similar to those disclosed in claim 37 above. Therefore a similar rejection applies.

10. Claims 39, 50 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claim 29, 41, respectively

above in view of Nash (US 6,317,589 B1) and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 39, as noted above, Boveda et al. discloses all limitations of claim 29 above. Boveda et al. does not however disclose, wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, an RF test signal source provides a test signal which is mixed with the first output and the second output to produce an l-based band signal and a Q-based band signal, the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the l-based band signal and the Q-based band signal, and an integrator, and the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance.

However, Nash discloses in Fig. 3, wherein a local oscillator (112) provides a fixed frequency signal to inputs of the first phase splitting filter (314) and the second phase splitting filter (314), an RF test signal source (102) provides a test signal which is mixed with the first output (110) and the second output (308) to produce an l-based band signal and a Q-based band signal.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Nash with the invention of Havens et al as a method of bringing the in-phase and quadrature signals toward the same strength (abstract).

Neither Boveda et al. nor Nash disclose the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the I-based band signal and the Q-based band signal, and an integrator, and the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator the differential amplifier producing an output to the first variable resistance.

However, Havens et al. discloses the circuitry capable of detecting the phase of the outputs (col. 6, lines 1-27) including a phase detector which detects phase differences between the I-based band signal and the Q-based band signal, and an integrator (Fig. 3, element 408), and the circuitry capable of adjusting the first variable resistance includes a differential amplifier (Fig. 6, element 310) having an input connected to the output of the integrator (Fig. 3, element 408), the differential amplifier producing an output to the first variable resistance.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Havens et al. with combined invention of Boveda et al. and Nash as a method of insuring a set phase difference value (col. 1, lines 19-28).

(2) With regard to claim 50, claim 50 discloses limitations similar to those disclosed in claim 39. Therefore a similar rejection applies.

11. Claims 40, 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator) as applied to claim 29, 41, respectively above in view of Nash (US 6,317,589 B1) and further in view of Havens et al. (US Patent 6,313,680 B1).

(1) With regard to claim 40, as noted above, Boveda et al. discloses all limitations of claim 29 above. Boveda et al. does not however disclose, wherein a local oscillator provides a fixed frequency signal to inputs of the first phase splitting filter and the second phase splitting filter, an RF test signal source provides a test signal which is mixed with the first output and the second output to produce first baseband signal and a second baseband signal, the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the first baseband signal and the second baseband signal, and an integrator, and the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that provides the differential output to the first variable resistance when the switch is open.

However, Nash discloses in Fig. 3, wherein a local oscillator (112) provides a fixed frequency signal to inputs of the first phase splitting filter (314) and the second phase splitting filter (314), an RF test signal source (102) provides a test signal which is mixed with the first output (110) and the second output (308) to produce first baseband signal and a second baseband signal.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Nash with the invention of Havens et al as a method of bringing the in-phase and quadrature signals toward the same strength (abstract).

Neither Boveda et al. nor Nash disclose the circuitry capable of detecting the phase of the outputs including a phase detector which detects phase differences between the first baseband

signal and the second baseband signal, and an integrator, and the circuitry capable of adjusting the first variable resistance includes a differential amplifier having an input connected to the output of the integrator, the differential amplifier producing an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that provides the differential output to the first variable resistance when the switch is open.

However, Havens et al. discloses the circuitry capable of detecting the phase of the outputs (col. 6, lines 1-27) including a phase detector which detects phase differences between the first baseband signal and the second baseband signal, and an integrator (Fig. 3, element 408), and the circuitry capable of adjusting the first variable resistance includes a differential amplifier (Fig. 6, element 310) having an input connected to the output of the integrator (Fig. 3, element 408),, the differential amplifier producing an output to the first variable resistance when a switch is closed, the differential amplifier output being stored in a capacitor that provides the differential output to the first variable resistance when the switch is open (col. 6, lines 27-42).

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Havens et al. with combined invention of Boveda et al. and Nash as a method of insuring a set phase difference value (col. 1, lines 19-28).

(2) With regard to claim 51, claim 51 discloses limitations similar to those disclosed in claim 40. Therefore a similar rejection applies.

12. Claims 52-54 are rejected under 35 U.S.C. 103(a) as being unpatentable over Baker et al. (US Patent 6,606,483 B1) in view of Proctor, Jr. et al. (US Patent 5,929,704) and further in view of Boveda et al. (A 0.7-3 GHz GaAs QPSK/QAM Direct Modulator).

(1) With regard to claim 52, Baker et al. discloses in Fig(s) 1, 2 a communication system (Fig. 1, element 100) comprising a transmitter (Fig. 1, element 106) and a receiver (Fig. 1, element 104), the transmitter comprising an input, an analog-to-digital converter (Fig. 2, element 252), a digital signal processor (Fig. 2, element 202), a digital-to-analog converter (Fig. 2, element 204) and an RF signal generator (Fig. 2, elements 220, 221), the transmitter modulating an RF carrier with a signal provided to the transmitter input and transmitting the modulated RF carrier (col. 1, lines 17-24).

Baker et al. is silent as to the make up of the receiver and consequently does not teach the receiver comprising an RF input, a local oscillator, a polyphase filter connected to an output of the local oscillator, the polyphase tilter producing first and second outputs from the local oscillator output, a mixer that combines the RF input with the first and second outputs of the polyphase filter, baseband circuitry, an analog-to-digital converter, and a digital signal processor that demodulates an output of the analog-to-digital converter, and produces a demodulated output, the polyphase filter including a first phase splitting filter that produces the first output, a second phase splitting filter that produces the second output, a first variable resistance connected across the first output, and circuitry capable of detecting the phase of the first and second outputs, and adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

However, Proctor, Jr. et al. discloses the receiver comprising an RF input, a local oscillator (67), a polyphase filter (60) connected to an output of the local oscillator, the polyphase tilter producing first (62) and second (63) outputs from the local oscillator output, a mixer (50, 70) that combines the RF input with the first and second outputs of the polyphase

filter, baseband circuitry (56, 76), an analog-to-digital converter (130, 150), and a digital signal processor (100) that demodulates an output of the analog-to-digital converter, and produces a demodulated output.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Procter, Jr. et al. with the invention of Baker et al. as a method of compensation for the misalignment of RF carriers in the system (col. 2, lines 24-46).

Neither Proctor, Jr. et al. or Baker et al. disclose a polyphase filter, comprising: a first phase splitting filter comprising a first RC network, the first phase splitting filter configured to provide a first output; a second phase splitting filter comprising a second RC network, the second phase splitting filter configured to provide a second output; a first variable resistance separate from the first RC network, the first variable resistance connected across the first output; and circuitry capable of detecting the phase of the outputs produced by the first and second outputs and circuitry capable of adjusting the first variable resistance to produce a desired phase difference between the first output and the second output.

However, Boveda et al. a polyphase filter, comprising: a first phase splitting filter comprising a first RC network, the first phase splitting filter configured to provide a first output; a second phase splitting filter comprising a second RC network, the second phase splitting filter configured to provide a second output; a first variable resistance separate from the first RC network, the first variable resistance connected across the first output; and circuitry capable of detecting the phase of the outputs produced by the first and second outputs (pg. 1341, III Circuit Design)., and circuitry capable of adjusting the first variable resistance to produce a desired phase difference between the first output and the second output (pg. 1344, Adjustable Phase

Shifter). Boveda et al. discloses the adjustable phase shifter with variable resistors and a trimmer for phase adjustment. Phase detecting would be inherent.

It would have been obvious to one skilled in the art at the time of invention to incorporate the teachings of Boveda et al. with the invention of Proctor, Jr. et al. in combination with Baker et al. as a method of controlling the phase difference between quadrature and in-phase components.

(2) With regard to claim 53, Baker et al. also discloses wherein the phase is substantially continuously detected and adjusted in a closed loop manner (abstract).

(3) With regard to claim 54, Baker et al. also discloses wherein the phase is adjusted at predetermined times in an open loop manner (abstract).

Conclusion

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

a.) Deboo discloses in US Patent 3,614,475 Phase shift Circuit Apparatus.

b.) Giolma et al. discloses in US Patent 4,110,707 Indirect FM Modulation Scheme Using Phase Locked Loop.

c.) Banu et al. discloses in US Patent 5,608,796 Balanced Phase Splitting Circuit.

d.) Forbes discloses in US 2002/0171497 A1 CMOS Voltage Controlled Phase Shift Oscillator.

e.) Kato discloses in US Patent 5,864,586 Radio apparatus With Offset Compensation Circuit.

f.) Ripley et al. discloses in US Patent 5,870,670 Integrated Image Reject Mixer.

14. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

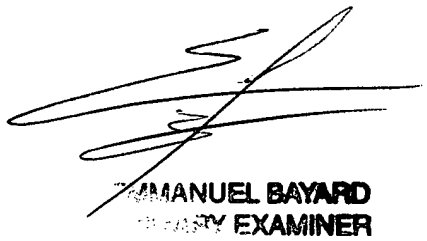
15. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Lawrence B Williams whose telephone number is 571-272-3037. The examiner can normally be reached on Monday-Friday (8:00-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Kenneth Vanderpuye can be reached on 571-272-3078. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Lawrence B. Williams

lbw
October 24, 2005



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